

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Original) A method of removing components of an injection mold machine, said machine comprising the following components: a core assembly including a master core plate, a core plate releasably secured to said master core plate, said master core plate including guide means for guiding said core plate relative to said master core plate; a core insert secured to said core plate; a cavity assembly comprising a manifold plate, a first cavity plate releasably secured to the manifold plate, said first cavity plate oriented in the opposing direction to the core plate, a cavity insert attached to the cavity plate, said cavity assembly moveable relative to the core assembly such that the cavity insert and core insert may be selectively mated together to define a cavity therebetween into which molten plastic may be injected from a molten plastic source, said cavity forming a shape of a desired article, said method comprising the steps of:

- (a) moving the core assembly and cavity assembly into a closed position whereat the cavity insert and core insert are mated together;
- (b) securing said core plate to said cavity plate, thereby forming a mold module;
- (c) releasing the securing means which secures the cavity plate to the manifold plate;
- (d) opening the mold from the closed position, until the first cavity plate disengages the manifold plate and all connections thereto,
- (e) releasing the securing means which secures the core plate to the master core

plate;

(f) lifting said mold module in a direction perpendicular to the direction of motion between said open and closed position, said module being guided in in said perpendicular direction by said guide means.

2. (Original) A method of removing components of a stack injection mold machine, said machine comprising: a stationary core assembly and an opposing facing moving core assembly each core assembly including a master core plate, and a core plate releasably secured to the master core plate, a first core insert secured to said core plate, an intermediate cavity assembly comprising two central manifold plates secured to each other, a pair of cavity plates releasably secured on either side of said manifold plates, each cavity plate having a cavity insert, said cavity assembly and moving core assembly movable by moving mold press means in such a manner that the core inserts and cavity inserts are separated by equal amounts on either side of the cavity assembly, and may be mated together simultaneously, the cavity and core inserts defining a cavity therebetween each, into which molten plastic may be injected from a molten plastic source, said cavities forming the shape of a desired article, the method comprising the following steps:

- (a) moving the core assemblies and cavity assembly into a closed position whereat the mating cavity inserts and core inserts are mated together;
- (b) securing the core plates to their respective mating cavity plates to form respective mold modules comprised of core plates, core inserts, cavity inserts and cavity plates;
- (c) releasing the securing means which secures the cavity plates to the manifold plate;
- (d) moving the moving core assembly and cavity assembly from the closed position to an open position until said cavity plates are separated from said manifold plate and all connections thereto;
- (e) releasing said securing means which secures said core plates to said

respective master core plates;

(f) hoisting said first and second mold modules simultaneously outwardly in a direction perpendicular to the direction of motion between said open and closed position, said modules being guided in said perpendicular direction by guiding means which guides said core plates perpendicularly along said master core plates.

3. (Currently Amended) The method as recited in claim 1 ~~or~~ 2, wherein said guide means comprises a set of roller guides secured to the master core plate and rollingly engaging said first core plate, said guide means following a guide path perpendicular to the motion of the mold machine, facilitating removal of said mold module from said mold machine.

4. (Original) The method as recited in claim 3 wherein said roller guides guide the core plate relative to said master core plate along a contoured slot defined in the master core plate, said slot being shaped to allow core plate to move vertically and parallel to master core plate for an initial period thereby causing disengagement of quick disconnect couplings between plates, then shaped to allow the core plate (and attached module) to move slightly away from the master core plate so that the mold module may be then be rapidly hoisted out of the mold machine.

5. (Original) The method as recited in claim 2 further comprising the step of applying an hoist attachment member simultaneously to the periphery of each said module when in closed position, said modules being slidably engaged to said hoist attachment, slidable in the direction of opening and closing the mold machine, such that when said modules are attached to the hoist attachment, they may be moved to the open position to allow said separation of cavity plates from said manifold plates and disengagement of quick disconnect couplings between plates, and once said modules are so separated and couplings disengaged, hoisting said hoist attachment.

6. (Original) The method as recited in claim 5 wherein said hoist attachment further includes a stop at opposite ends thereof, which limits the sliding movement of each block beyond the point where said cavity plates and components thereof are separated from said manifold plate and accommodates replacement modules with the same dimensions.

7. (Currently Amended) The method as recited in claim 1 ~~or~~ 2 comprising the further step of attaching hoisting means to each said mold module after said step (d) and prior to said step (e).

8. (Currently Amended) The method as recited in claims 1 ~~or~~ 2, wherein said mold machine defines water and air conduits extending between at least two adjacent plates, said conduits being selectively disengageable and reengageable by quick disconnect couplings during module removal and reattachment respectively.

9. (Original) The method as recited in claim 2 wherein mating locating keys are positioned to locate said modules for reattachment upon said mold machine.

10. (Currently Amended) The method as recited in claim 1 ~~to~~ 4 wherein said securing means securing said cavity plate to the manifold plate are releasable straps secured across the periphery of said cavity and manifold plates and said securing means securing each said core plate to said master core plates is clamp bar means.

11. (Original) A method of removing components of an injection mold machine, said machine comprising the following components: a core assembly including a master core plate, a cavity plate releasably secured to said master core plate, said master core plate including guide means for guiding said cavity plate relative to said master core plate; a cavity insert secured to said cavity plate, an intermediate assembly comprising

manifold plates, a first core plate releasably secured to the manifold plate, said first core plate oriented in the opposing direction to the cavity plate, a core insert attached to the core plate, said intermediate assembly moveable relative to the core assembly such that the cavity insert and core insert may be selectively mated together to define a cavity therebetween into which molten plastic may be injected from a molten plastic source, said cavity forming a shape of a desired article, said method comprising the steps of:

- (a) moving the core assembly and intermediate assembly into a closed position whereat the cavity insert and core insert are mated together;
- (b) securing said core plate to said cavity plate, thereby forming a mold module;
- (c) releasing the securing means which secures the core plate to the manifold plate;
- (d) opening the mold from the closed position, until the first core plate disengages the manifold plate and all connections thereto,
- (e) releasing the securing means which secures the cavity plate to the master core plate;
- (f) lifting said mold module in a direction perpendicular to the direction of motion between said open and closed position, said module being guided in in said perpendicular direction by said guide means.

12. (Original) The method as recited in claim 11 further comprising the step of applying an hoist attachment member simultaneously to the periphery of each said module when in said closed position, said modules being slidably engaged to said hoist attachment, slidable in the direction of opening and closing the mold machine, such that when said modules are attached to the hoist attachment, they may be moved to the open position to allow said separation of core plates from said manifold plates and disengagement of quick disconnect couplings between plates, and once said modules are so separated and couplings disengaged, hoisting said hoist attachment.

13. (Original) A hoist bar, comprising a main bar having an upper side and a lower side, and a pair of blocks secured to the lower side of said bar at opposite ends thereof, each block having an opening parallel to the length of the bar, said bar having at least one hoist member secured to the upper side of the bar, said hoist member adapted for lifting said bar, a guide pin extending through the opening in each said block, said guide pins having mounting blocks at the end of each guide pin, which limit the sliding movement of the guide pins within each opening, each said mounting block being adapted to mount a mold plate, thereby when said mounting blocks are mounted to said plates, said plates may slide relative to the main bar, and said hoist bar may be lifted when said mounted mold plates have slid into a selectable relative sliding position on the lift bar.

14. (Canceled).

15. (Currently Amended) The method as recited in claim 1, 2 or 11 wherein a mold support apparatus supports the mold plates within said mold machine, said apparatus comprising mold support pieces interconnecting said plates to said machine, each said support piece engaged to one said plate and the tie bars or guide ways of said machine, each said support pieces positionable between an operable position wherein each interconnects said plate to said tie bars or guide ways and an inoperable position, wherein said support piece nests within said mold plate.

16. (Original) An apparatus for removing components of an injection mold machine, said machine comprising the following components: a core assembly including a master core plate, a core plate releasably secured to said master core plate, said master core plate including guide means for guiding said core plate for movement relative to said master core plate; said core plate including a core insert secured to said core plate, the core insert having a front face;

a cavity assembly comprising a manifold plate, a first cavity plate releasably

secured to the manifold plate, said first cavity plate oriented in the opposing direction to the core plate, a cavity insert attached to the cavity plate, said cavity assembly moveable relative to the core assembly between open and closed positions such that in the closed position, the cavity insert and core insert may be selectively mated together to define a cavity therebetween into which molten plastic may be injected from a molten plastic source, said cavity forming a shape of a desired article in said closed position, the core plate may be secured to said cavity plate to form a mold module, whereby when said cavity plate is released from securement to the manifold plate and all connections therebetween are disengaged, and the core plate is released from securement to the master core plate and all connections therebetween are disengaged, the mold module may be lifted in a direction perpendicular to the direction of motion between said open and closed position, said module being guided in said perpendicular direction by said guide means.

17. (Original) An apparatus for removing components of a stack injection mold machine, comprising: a stationary core assembly and an opposing facing moving core assembly each core assembly including a master core plate, and a core plate releasably secured to the master core plate, said core plate having a face, a first core insert secured to said core plate face, an intermediate cavity assembly comprising central manifold plates having opposing sides, one side facing the stationary core assembly the other side facing the moving core assembly, one cavity plate releasably secured to each said opposing side of the manifold plates, each cavity plate having a cavity insert secured thereto, one cavity plate and insert facing the core plate and insert of stationary core assembly to form one cavity core insert pair, and the other cavity plate and insert facing the core plate and core insert of the moving core assembly to form another cavity core insert pair, said cavity assembly and moving core assembly movable by moving mold press means in such a manner that the cavity and core insert of each pair are separated by equal amounts on either side of the cavity assembly, and in a closed position, the cavity and core inserts of each pair are be mated together

simultaneously defining a cavity between the inserts of each pair, into which molten plastic may be injected from a molten plastic source, said cavities forming the shape of a desired article, and in said closed position, the core plate and cavity plate of each pair may be secured together to form respective mold modules each comprised of a core plate, core inserts, cavity insert and cavity plate; once said cavity plates are released from securement to the manifold plates and all connections therebetween disengaged, the moving core assembly and cavity assembly may be moved from the closed position to an open position where said cavity plates become separated from said manifold plates; and once said core plates are released from securement to said respective master core plates and all connections therebetween are disengaged, said first and second mold modules may be simultaneously hoisted outwardly in a direction perpendicular to the direction of motion between said open and closed position, said modules being guided in said perpendicular direction by guiding means which guides said core plates perpendicularly along said master core plates.

18. (Currently Amended) The apparatus as recited in claim 16 or 17, wherein said guide means comprises a set of roller guides secured to the master core plate and rollingly engaging said first core plate, said guide means forming a guide path perpendicular to the motion of the mold machine, facilitating removal of each said mold module from said mold machine.

19. (Original) The apparatus as recited in claim 18 wherein said roller guides guide the core plate relative to said master core plate along a countoured slot defined in the master core plate, said slot being shaped to allow core plate to move vertically and parallel to master core plate for an initial distance thereby causing disengagement of quick disconnect couplings between plates, then spaced away from the master core plate for a further distance so as to accommodate the mold module from being rapidly hoisted out of the mold machine.

20. (Currently Amended) The apparatus as recited in claims 16 to 19 wherein the position of said cavity plates and core plates are interchanged.

21. (Original) The apparatus as recited in claim 17 further comprising a hoist attachment member secured simultaneously to the periphery of each said module when in said closed position, said modules being slidably engaged to said hoist attachment, slidable in the direction of opening and closing the mold machine, such that when said modules are attached to the hoist attachment, each said module may be moved to the open position from said closed position to allow said separation of the cavity plates of each module from the manifold plates, and once said cavity plates are so separated, and said core plates released from securement to said master core plates, said mold modules may be hoisted out of said mold machine.

22. (Original) The apparatus as recited in claim 21 wherein said hoist attachment further includes a stop at opposite ends thereof, which limits the sliding movement of each block beyond the point where said cavity plates and components thereof are separated from said manifold plate.

23. (Currently Amended) The apparatus as recited in ~~any one of~~ claims 16 to 22 wherein said machine further comprises an ejector plate operable to assist in ejection of the molded article from within said cavity, said ejector plate defining a slot therethrough extending from a central portion of said plate to a peripheral portion of the plate, said plate having a linking plate secured across said slot at said peripheral portion to reinforce said plate across said slot.

24. (Original) The apparatus as recited in claim 21 wherein said hoist attachment comprises a main bar having an upper side and a lower side, and a pair of blocks secured to the lower side of said bar at opposite ends thereof, each block having an

opening parallel to the length of the bar, said bar having at least one hoist member secured to the upper side of the bar, said hoist member adapted for lifting said bar, a guide pin extending through the opening in each said block, said guide pins having mounting blocks at the end of each guide pin, which limit the sliding movement of the guide pins within each opening, one said mounting block being adapted to mount a core mold plate and the other a cavity plate of each said mold module, such that when said mounting blocks are mounted to said plates, said plates may slide relative to the main bar, and said hoist bar may be lifted when said mounted mold plates are positioned in said open position.

25. (Original) The apparatus as recited in claim 24 wherein said at least one hoist member comprises a eye bolt secured to the upper side of the bar.

26. (Original) The apparatus as recited in claim 25 wherein one said eye bolt is positioned at the center of the bar.

27. (Original) The apparatus as recited in claim 25 wherein one said eye bolt is positioned at each opposite end of the bar.

28. (Currently Amended) The apparatus as recited in ~~any one of~~ claims 16 to 27 wherein said core plates may be secured to the cavity plate to form said mold module by safety straps secured between the periphery of each said core plate and cavity plate and said cavity plates are releasably secured to said manifold plates by removable straps and said core plates are releasably secured to said master core plates by clamp bar means.

29. (Canceled).

30. (Canceled).

31. (Original) An apparatus for supporting mold plates within a mold machine, said apparatus comprising: a mold support member, said support member being positionable between an operable position whereat said support member interconnects by interconnection means said plates to a tie bar or guide way of the mold machine, allowing riding of said plate on said tie bar or guide way and an inoperable position whereat said interconnection means nests within a pocket in said plate.

32. (Original) An apparatus as recited in claim 31 wherein said interconnection means comprises support pins, and said mold plate includes a pocket shaped to accept said support pins which are moveable within said pocket between an *extended* position where they stick out towards said tie bars and hold the support member in the operable position, and a *retracted* position where they are nested in the pockets of the mold plates, in the inoperable position, said support pins being guided by bushings held in fixed position in mold plates, a stopper being used to secure each support pin in one of the positions, and to prevent it from disengaging from the mold plate.

33. (Original) The apparatus as recited in claim 32 wherein said mold support apparatus includes, a bracket portion, a support pad and a locating key, the bracket portion being secured to the pin, the bracket portion being fastened to the support pad which has a surface shaped to rest onto the tie bars of the injection machine, said locating key locating the support pad in reference to the bracket portion.

34. (Original) The apparatus as recited in claim 33 wherein the support pad is made of a material with low coefficient of friction, in order to avoid scoring the tie bars of the injection machine.

35. (Original) The apparatus as recited in claim 33 wherein said support pin has multiple locations for the stopper, thus providing more than one operating position and said size variability.

36. (Original) The apparatus as recited in claim 33 which is adapted to ride on machine guide ways.

37. (Original) The apparatus as recited in claim 31 wherein the mold support member is permanently attached to one said mold plate, pivotable around a pivot point on said plate between said operable position and said inoperable position, when in said inoperable position said member is positioned within a pocket defined in said plate.

38. (Canceled).

39. (Canceled).

40. (Original) The apparatus as recited in claim 33 wherein said bracket portion may be adjustable in size to accommodate various spacings of said tie bars and guide ways.

41. (Original) The apparatus as recited in claim 28 wherein the clamp bar means includes at least one clamp bar securing the plates together with screwable fasteners, the at least one clamp bar including a pre loaded spring under the clamp which provides lift to open the clamp as the screwable fasteners are unscrewed.

42. (Original) The apparatus as recited in claim 41 wherein each said at least one clamp bar is secured using two spaced apart bolts.

43. (Original) The apparatus as recited in claim 42 wherein said master core plate utilizes between 4 and 6 said clamp bars.
